METTLER TOLEDO

Operation Manual
Transmitter O_2 M300

Transmitter O_2 M300
52 121 305

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Transmitter O_2 M300

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1 Introduction

Statement of Intended Use – The M300 O_2 transmitter is a single-channel online process instrument for measuring conductivity or resistivity of fluids. It will interface with a variety of different Mettler-Toledo sensors, which connect to the transmitter using cables of varied lengths.

A large four line backlit Liquid Crystal Display conveys measuring data and setup information. The menu structure allows the operator to modify all operational parameters by using keys on the front panel. A menu-lockout feature, with password protection, is available to prevent the unauthorized use of the meter. The M300 transmitter can be configured to use its two analog and/or four relay outputs for process control.

The M300 transmitter is equipped with a USB communication interface. This interface provides real-time data output and complete instrument configuration capabilities for central monitoring via Personal Computer (PC).

2 Safety instructions

This manual includes safety information with the following designations and formats.

2.1 Definition of equipment and documentation symbols and designations

WARNING: POTENTIAL FOR PERSONAL INJURY.

CAUTION: possible instrument damage or malfunction.

NOTE: Important operating information.

On the transmitter or in this manual text indicates: Caution and/or other possible hazard including risk of electric shock (refer to accompanying documents)

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The following is a list of general safety instructions and warnings. Failure to adhere to these instructions can result in damage to the equipment and/or personal injury to the operator.

- The M300 Transmitter should be installed and operated only by personnel familiar with the transmitter and who are qualified for such work.
- The M300 Transmitter must only be operated under the specified operating conditions (see section 16).
- Repair of the M300 Transmitter must be performed by authorized, trained personnel only.
- With the exception of routine maintenance, cleaning procedures or fuse replacement, as described in this manual, the M300 Transmitter must not be tampered with or altered in any manner.
- Mettler-Toledo accepts no responsibility for damage caused by unauthorized modifications to the transmitter.
- Follow all warnings, cautions, and instructions indicated on and supplied with this product.
- Install equipment as specified in this instruction manual. Follow appropriate local and national codes.
- Protective covers must be in place at all times during normal operation.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by it against hazards may be impaired.

WARNINGS:

Installation of cable connections and servicing of this product require access to shock hazard voltage levels.
Main power and relay contacts wired to separate power source must be disconnected before servicing.
Switch or circuit breaker shall be in close proximity to the equipment and within easy reach of the OPERATOR; it shall be marked as the disconnecting device for the equipment.
Main power must employ a switch or circuit breaker as the disconnecting device for the equipment.
Electrical installation must be in accordance with the National Electrical Code and/or any other applicable national or local codes.

RELAY CONTROL ACTION: the M300 transmitter relays will always de-energize on loss of power, equivalent to normal state, regardless of relay state setting for powered operation. Configure any control system using these relays with fail-safe logic accordingly.

PROCESS UPSETS: Because process and safety conditions may depend on consistent operation of this transmitter, provide appropriate means to maintain operation during sensor cleaning, replacement or sensor or instrument calibration.

2.2 Correct disposal of the unit

When the transmitter is finally removed from service, observe all local environmental regulations for proper disposal.

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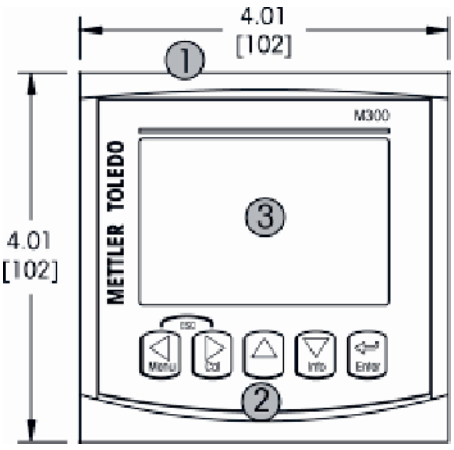
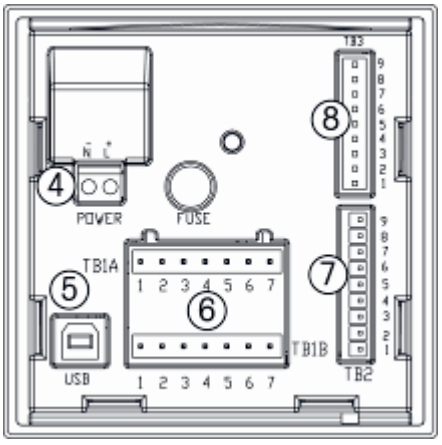
3 Unit overview

M300 models are available in both a 1/4DIN and 1/2DIN case size. The 1/4DIN is a panel-mount only design and the 1/2DIN models provides an integral IP65 housing for wall-, or pipe-mount.

3.1 Overview 1/4DIN





1 – Hard Polycarbonate case
2 – Five Tactile-Feedback Navigation Keys
3 – Four-line LCD Display
4 – Power Supply Terminals
5 – USB Interface Port
6 – Relay Output Terminals
7 – Analog Output/Digital Input Terminals
8 – Sensor Input Terminals

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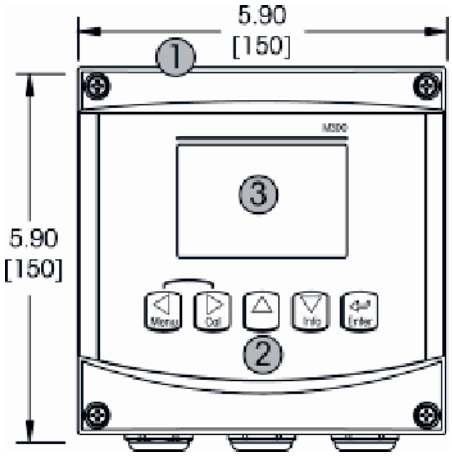
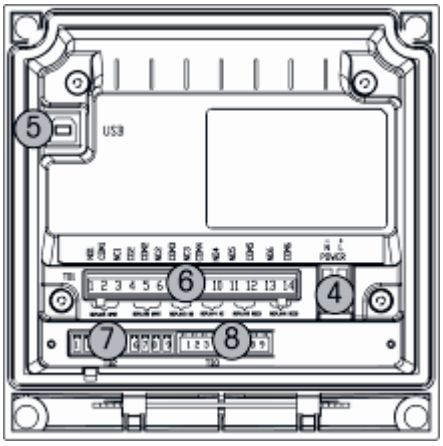
3.2 Overview 1/2DIN





1 – Hard Polycarbonate case
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7 – Analog Output/Digital Input Terminals
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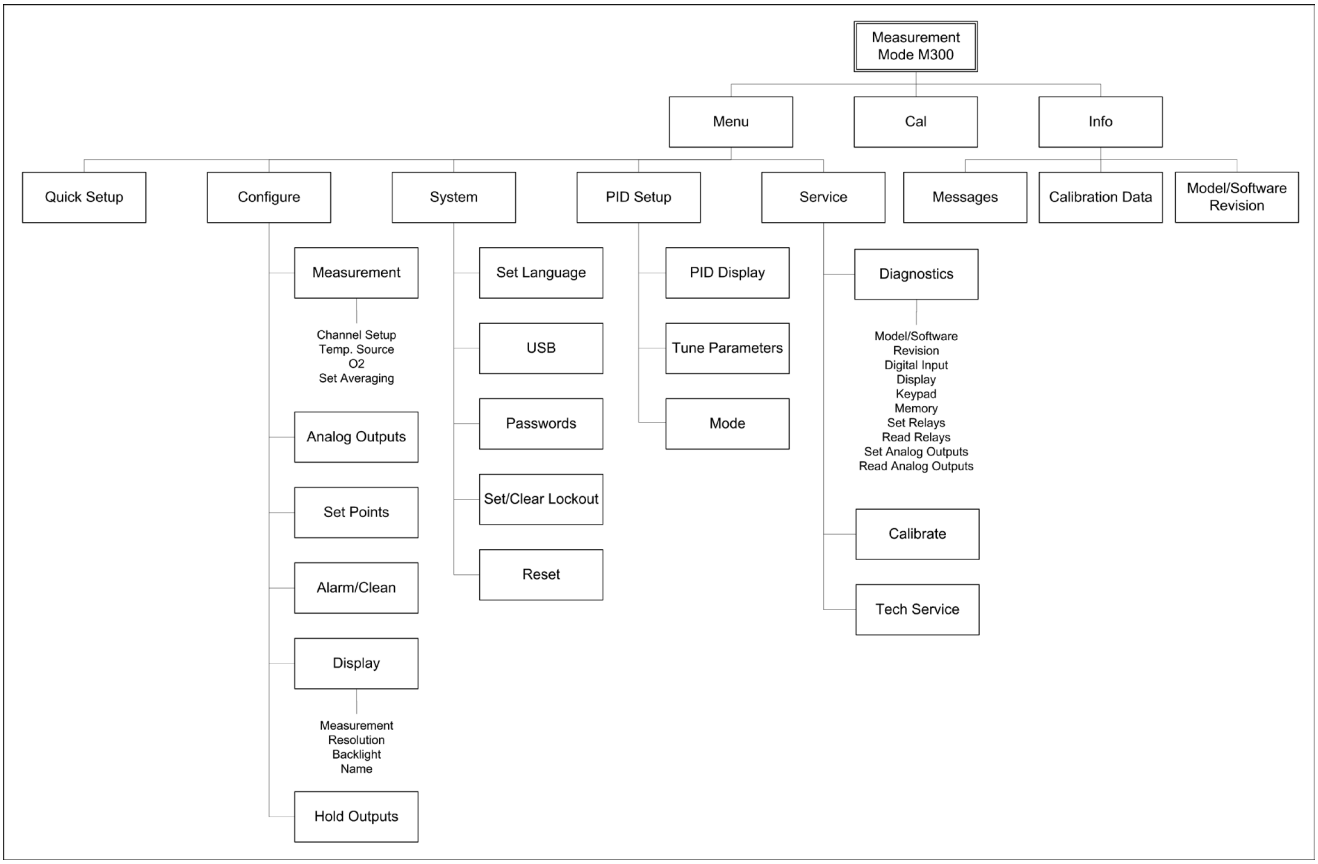
3.3 Control/Navigation Keys

3.3.1 Menu Structure

Below is the structure of the M300 menu tree:



3.3.2 Navigation keys

3.3.2.1 Navigating the menu tree

Enter the desired main Menu branch with the ◄, ► or ▲ keys. Use the ▲ and ▼ keys to navigate through the selected Menu branch.

☞ **NOTE:** In order to back up one menu page, without escaping to the measurement mode, move the cursor under the UP Arrow character at the bottom right of the display screen and press [Enter].

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3.3.2.2 Escape

Press the ◀ and ▶ key simultaneously (escape) to return to the Measurement mode.

3.3.2.3 Enter

Use the ↵ key to confirm action or selections.

3.3.2.4 Menu

Press the ◀ key to access the main Menu.

3.3.2.5 Calibration mode

Press the ▶ key to enter Calibration Mode.

3.3.2.6 Info mode

Press the ▼ key to enter Info Mode

3.3.3 Navigation of data entry fields

Use the ▶ key to navigate forward or the ◀ key to navigate backwards within the changeable data entry fields of the display.

3.3.4 Entry of data values, selection of data entry options

Use the ▲ key to increase or the ▼ key to decrease a digit. Use the same keys to navigate within a selection of values or options of a data entry field.

NOTE: Some screens require configuring multiple values via the same data field (ex: configuring multiple setpoints). Be sure to use the ▶ or ◀ key to return to the primary field and the ▲ or ▼ key to toggle between all configuration options before entering to the next display screen.

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3.3.5 Navigation with ↑ in Display

If a ↑ is displayed on the bottom right hand corner of the display, you can use the ▶ or the ◀ key to navigate to it. If you click [ENTER] you will navigate backwards through the menu (go back one screen). This can be a very useful option to move back up the menu tree without having to exit into the measuring mode and re-enter the menu.

3.3.6 "Save changes" dialog

Three options are possible for the "Save changes" dialog: Yes & Exit (Save changes and exit to measuring mode), "Yes & ↑" (Save changes and go back one screen) and "No & Exit" (Don't save changes and exit to measuring mode). The "Yes & ↑" option is very useful if you want to continue configuring without having to re-enter the menu.

3.3.7 Security Passwords

The M300 transmitter allows a security lock-out of various menus. If the security lock-out feature of the transmitter has been enabled, a security password must be entered to allow access to the menu. See section 9.3 for more information.

3.4 Display

NOTE: In the event of an alarm or other error condition the M300 Transmitter will display a flashing ⚠ in the upper right corner of the display. This symbol will remain until the condition that caused it has been cleared.

NOTE: During calibrations, clean, Digital In with Analog Output/Relay/USB in Hold state, a flashing H will appear in the upper left corner of the display. This symbol will remain for 20 seconds until after the calibration or clean is completed .This symbol will also disappear when Digital In is deactivated.

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4 Installation instruction

4.1 Unpacking and inspection of equipment

Inspect the shipping container. If it is damaged, contact the shipper immediately for instructions. Do not discard the box.

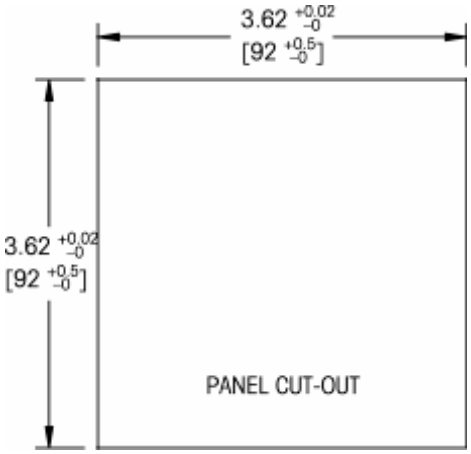
If there is no apparent damage, unpack the container. Be sure all items shown on the packing list are present.
If items are missing, notify Mettler-Toledo immediately

4.1.1 Panel cutout dimensional information – 1/4DIN models

1/4DIN Model transmitters are designed for panel-mount installation only. Each transmitter is supplied with mounting hardware to provide fast and simple installation to a flat panel or flat enclosure door. To insure a good seal and maintain IP integrity of installation, the panel or door must be flat and have a smooth finish. Hardware consists of:

Two – Snap-on Mounting brackets
One – Mounting gasket seal

Transmitter dimensions and mounting are shown in figures below.



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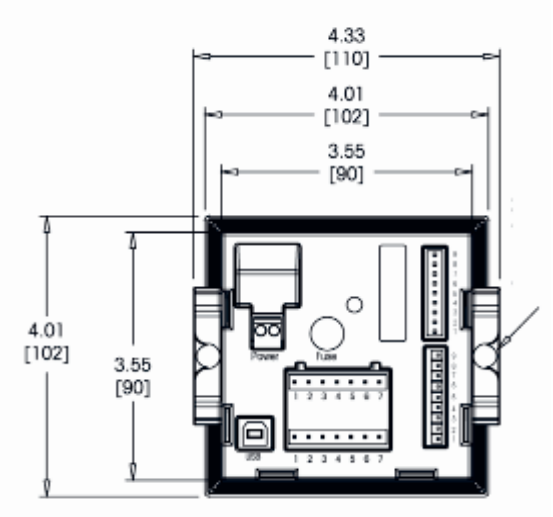
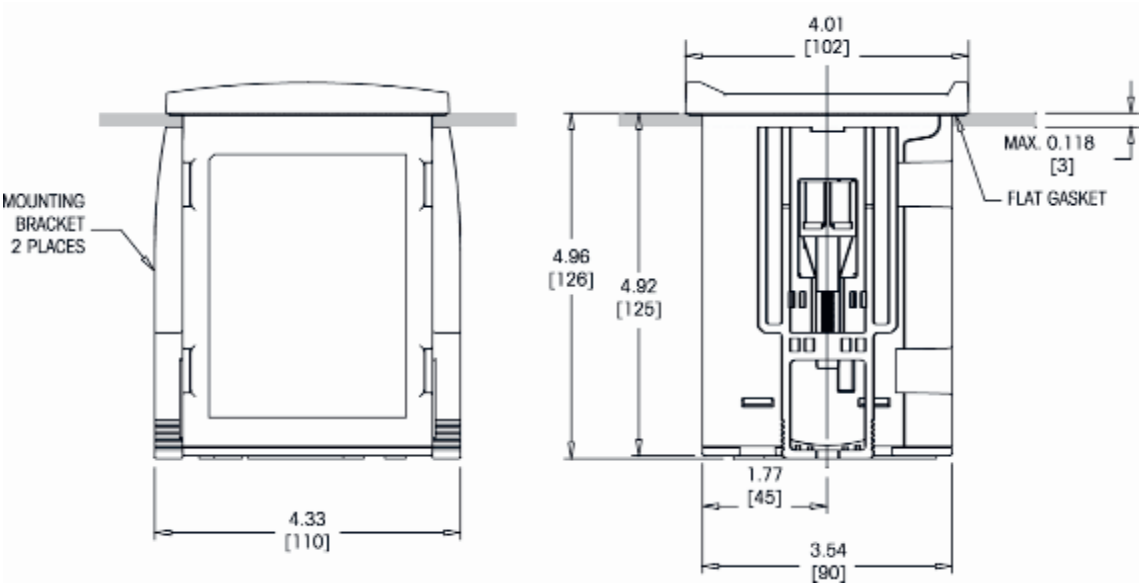
4.1.2 Installation procedure – 1/4DIN models

- Make cutout in panel (see dimensions cutout drawing).
- Be sure surface surrounding cutout is clean, smooth and free of burrs.
- Slide face gasket (supplied with transmitter) around transmitter from the back of the unit.
- Place transmitter into cutout hole. Be sure there are no gaps between the transmitter and panel surface.
- Place the two mounting brackets on either side of the transmitter as shown
- While holding transmitter firmly into the cutout hole, push the mounting brackets toward the backside of panel
- Once secure, use a screwdriver to tighten the brackets against the panel
- Face gasket will compress between transmitter and panel

CAUTION: Do not over tighten brackets

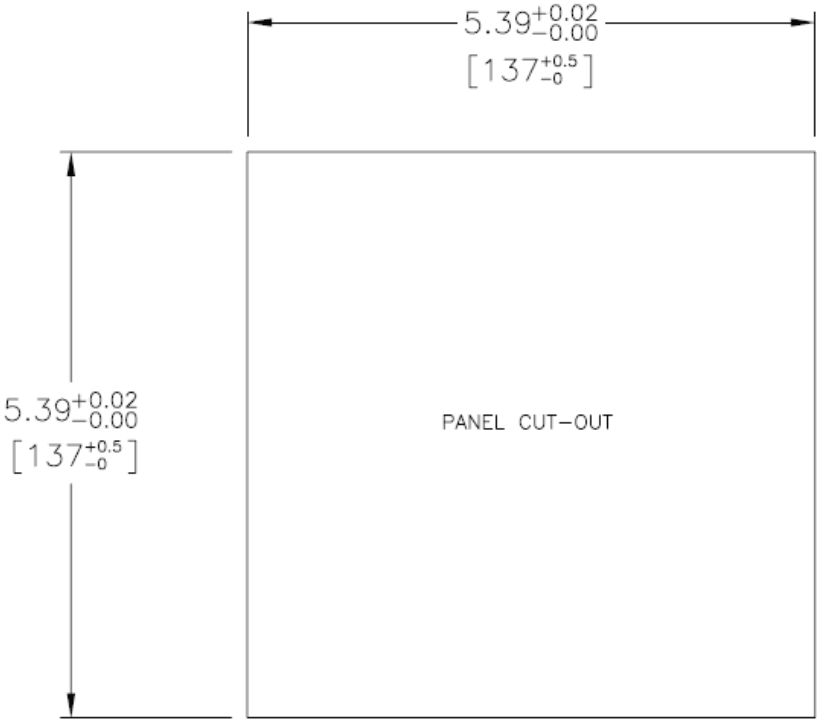




4.1.3 Panel cutout dimensional information – 1/2DIN models

1/2DIN Model transmitters are designed with an integral rear cover for stand-alone wall mount installation.
The unit may also be wall mounted using the integral rear cover. See installation instructions in Section 4.1.4.

Below are cut-out dimensions required by the 1/2DIN models when mounted within a flat panel or on a flat enclosure door. This surface must be flat and smooth. Textured or rough surfaces are not recommended and may limit the effectiveness of the gasket seal provided.



Optional hardware accessories are available that allow for panel- or pipe-mount.
Refer to Section 15 for ordering information.

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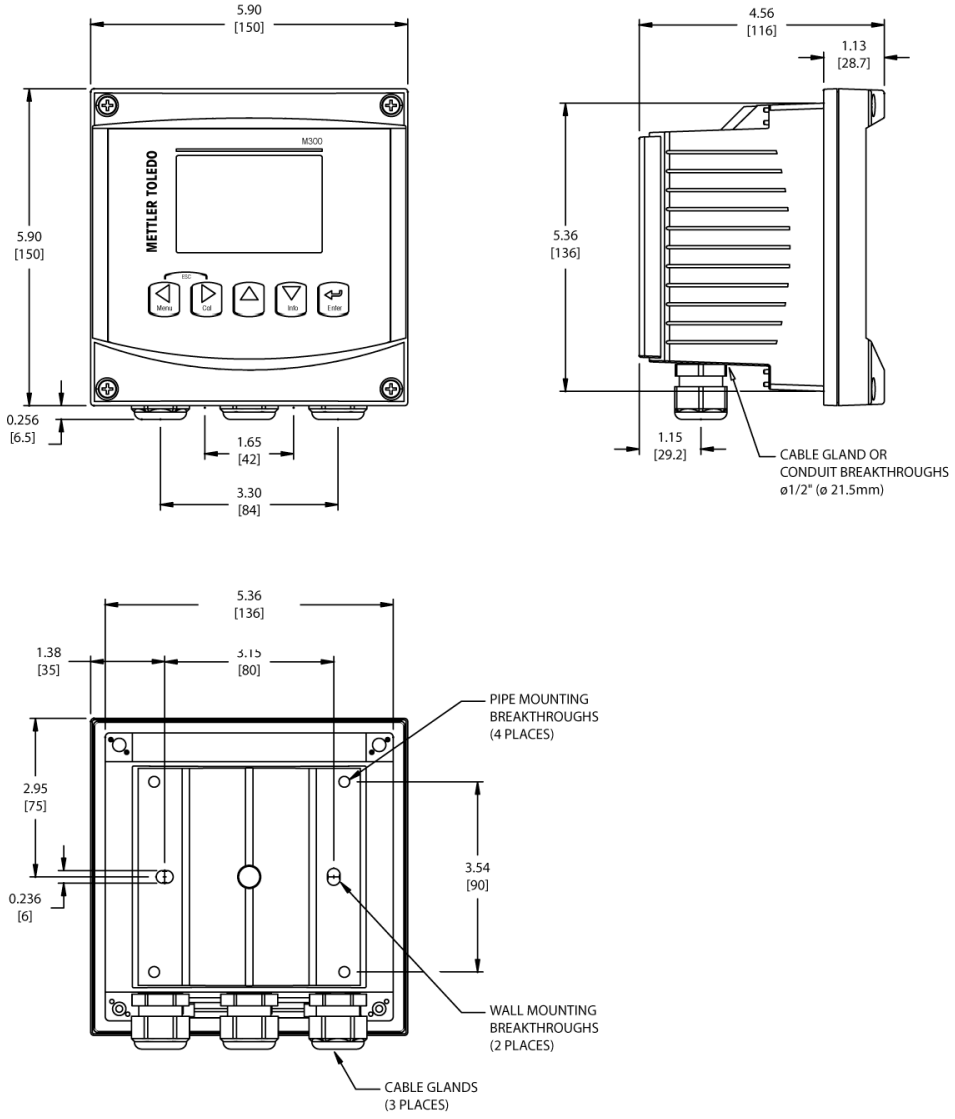
4.1.4 Installation procedure – 1/2DIN models

For Wall Mount:
- Remove rear cover from front housing.
- Start by unscrewing the four screws located on the face of the transmitter, in each corner. This allows the front cover to swing away from the rear housing.
- Remove the hinge-pin by squeezing the pin from each end. This allows the front housing to be removed from the rear housing
- Drill out wall-mount breakthroughs in the rear housing.
- Mount rear housing to wall using appropriate mounting hardware for wall surface. Be sure it is level and securely fastened and the installation adheres to any and all clearance dimensions required for transmitter service and maintenance.
- Insert two black protective covers (supplied with the M300 transmitter) over the fixing hardware and into the space on the inside back cover, as shown in the drawing below. This is necessary to maintain unit integrity.
- Replace the front housing to the rear housing. The unit is ready to be wired.

For Pipe Mount:
- Use only manufacturer-supplied components for pipe-mounting the M300 transmitter and install per the supplied instructions. See section 15 for ordering information.



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4.2 Connection of power supply

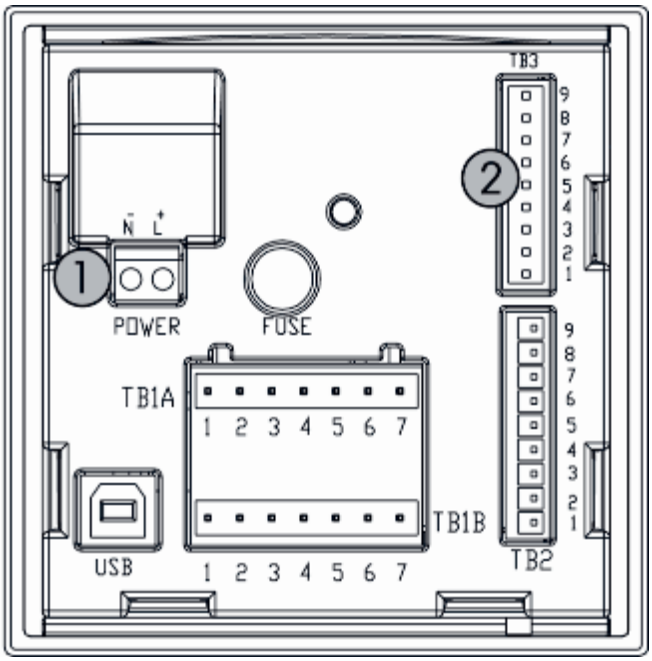
All connections to the transmitter are made on the rear panel of all models.

Be sure power to all wires is turned off before proceeding with the installation. High voltage may be present on the input power wires and relay wires.

A two-terminal connector on the rear panel of all M300 models is provided for power connection. All M300 models are designed to operate from a 20–30 VDC or a 100 to 240 VAC power source. Refer to specifications for power requirements and ratings and size power wiring accordingly.

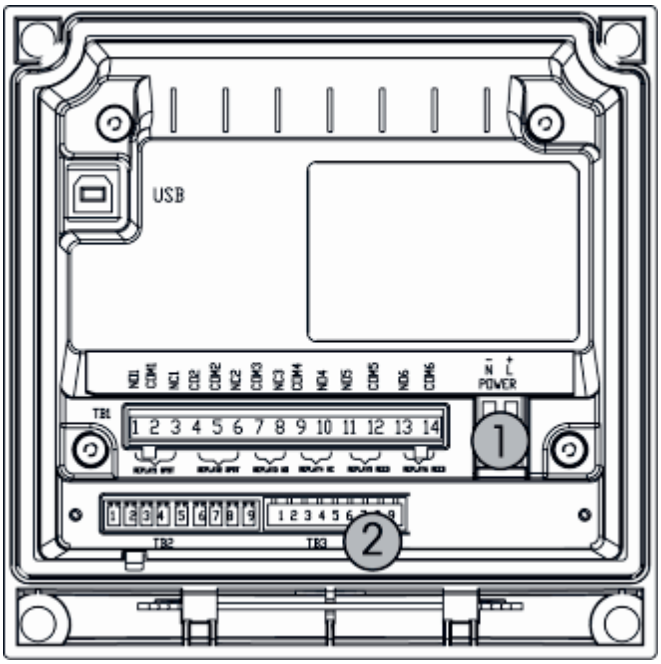
The terminal block for power connections is labeled "Power" on the rear panel of the transmitter. One terminal is labeled **– N** for the Neutral wire and the other **+L** for the Line (or Load) wire. There is no earth ground terminal on the transmitter. For this reason the internal power wiring within the transmitter is double insulated and the product label designates this using the ⧈ symbol.

4.2.1 1/4DIN housing (panel mount)



1 Connection of power supply
2 Terminal for sensor

4.2.2 1/2DIN housing (wall mount)



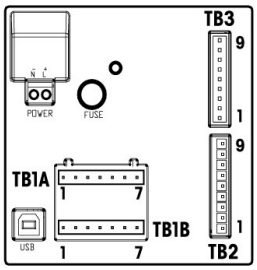
1 Connection of power supply
2 Terminal for sensor

4.3 Connector PIN definition

4.3.1 TB1 and TB2 for 1/2DIN and 1/4DIN versions

¼ DIN

TB2 for ¼ DIN	
1	AO1+
2	AO1–/AO2–
3	AO2+
4	–
5	–
6	–
7	DI1+
8	DI1–
9	–

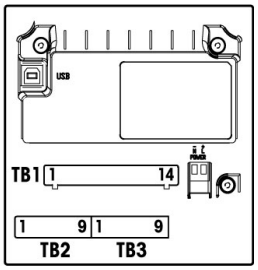


TB1A for ¼ DIN	
1	NO2
2	COM2
3	NC2
4	–
5	–
6	NO4
7	COM4

TB1B for ¼ DIN	
1	NO1
2	COM1
3	NC1
4	–
5	–
6	NO3
7	COM3

½ DIN

TB2 for ½ DIN	
1	AO1+
2	AO1–/AO2–
3	AO2+
4	–
5	–
6	–
7	DI1+
8	DI1–
9	–



TB1 for ½ DIN			
1	NO1	8	–
2	COM1	9	–
3	NC1	10	–
4	NO2	11	NO3
5	COM2	12	COM3
6	NC2	13	NO4
7	–	14	COM4

NO = normally open (contact is open if unactuated). NC = normally closed (contact is closed if unactuated).

4.3.2 TB3 for 1/2DIN and 1/4DIN versions

Sensor	Colour	Pin no.	Transmitter
		1	–
Anode	Coax shield/red	2	Anode
		3	–
Cable shield	green/yellow	4	Shield/GND
Cathode	Coax inner/transparent	5	Cathode
NTC1	white	6	GND
		7	
NTC2	green	8	NTC
		9	+5V

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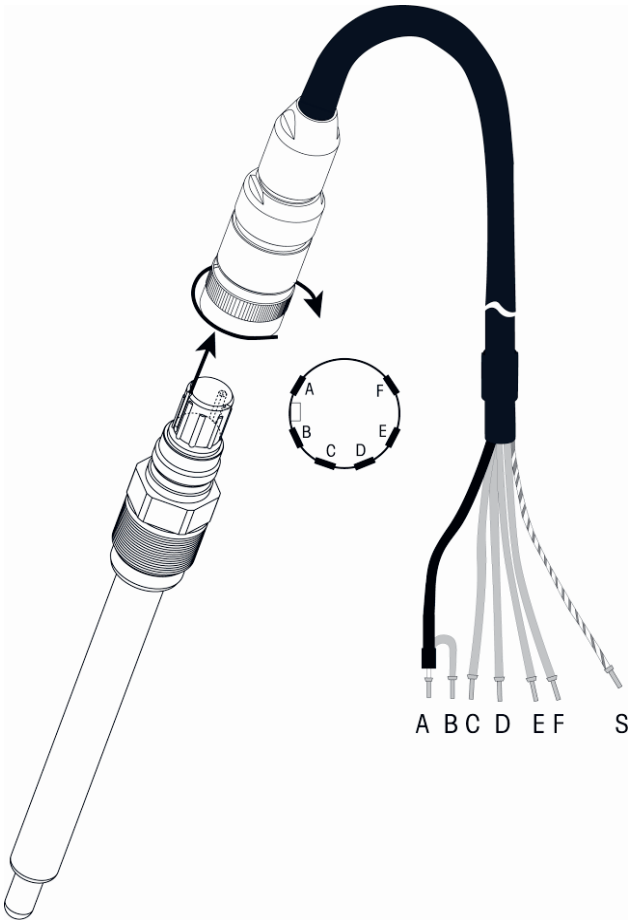
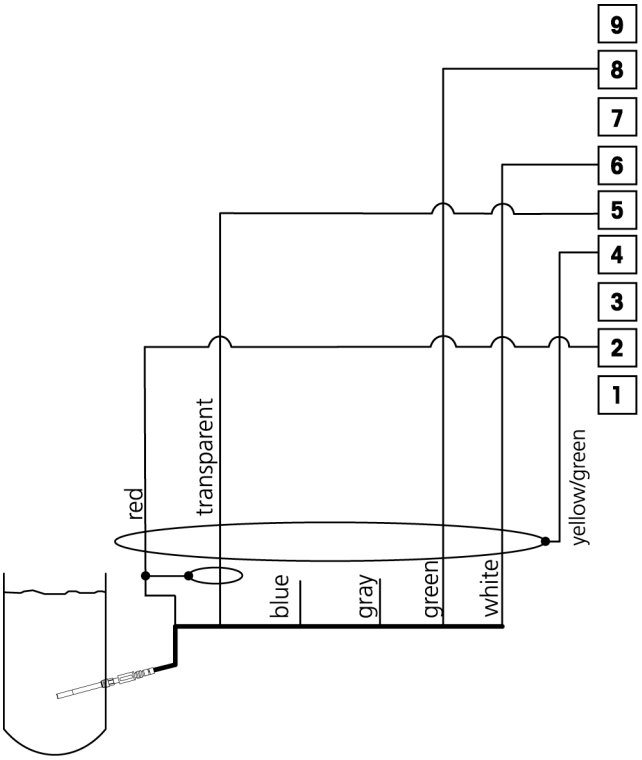
4.4 Connection of sensor

4.4.1 Connecting the sensor to the VP cable



NOTE: Be sure to observe the sensor instruction manual.

4.4.2 Typical wiring



NOTE: Wire colors only valid for connection with VP cable, blue and grey not connected.

M300 TB3 connector:

1 – not used
2 – Anode
3 – not used
4 – Shield/GND
5 – Cathode
6 – Analog GND
7 – NTC 1
8 – NTC 2
9 – +5V

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5 Placing transmitter in, or out, of service

5.1 Placing transmitter in service

After connecting the transmitter to power supply circuit, it will be active as soon as the circuit is powered.

5.2 Placing transmitter out of service

First disconnect the unit from the main power source, then disconnect all remaining electrical connections. Remove the unit from the wall/panel. Use the installation instruction in this manual as reference for dis-assembling mounting hardware

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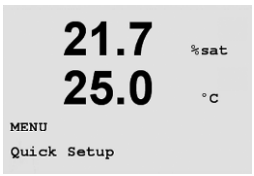
6 Quick setup

(PATH: Menu/Quick Setup)



While in Measurement mode press the [MENU] key to bring up the Menu selection. Select "Quick Setup" and press the [ENTER] key. The display prompts you to enter the Quick Setup security code. Enter the Quick Setup security code to "xxxxx", then press the [ENTER] key to confirm the Quick Setup security code.

Convention:
1st line on display => a
2nd line on display => b
3rd line on display => c
4th line on display => d
Only lines a and b can be configured in Quick setup. Go to the Configuration Menu to configure lines c and d.

6.1 Channel selection

Select a or c to configure the values to be displayed. Please use the Configuration menu to freely configure the channels.
Example:
By selecting a and O_2 as unit, the O_2 value will be displayed on the 1st line. By selecting b and O_2 as unit, the O_2 value will be displayed on the 3rd line of the display.
By selecting a and °C as unit, the temperature will be displayed on the 1st line. By selecting b and °C as unit, the temperature will be displayed on the 3rd line.

6.2 Analog outputs

On the screen above, by selecting „Yes" the linear 4-20 mA analog output Aout1 will be setup when [ENTER] is pressed. Selecting „No" means that no analog output is setup.
Aout1 min, Aout1 max are the minimum and maximum measurement values for the 4 and 20mA values respectively. To configure output 2, use the Configuration Menu. Press [ENTER}.

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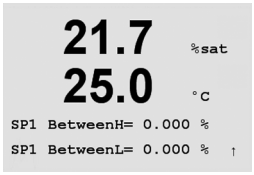
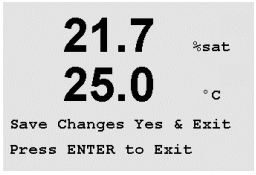
6.3 Set points

After configuring the Analog Output a Set Point can be configured for that measurement. If „No" is selected and [ENTER] is pressed then the quick setup is done and the menus are exited without setting up any Setpoint.



Selecting '„Yes"' and pressing [ENTER] means a Set Point can be configured for channel a. Following Set Point Types can be selected:
High, Low, Between (an alarm is triggered if the measured value is between the specified range), Outside (an alarm is triggered if the measured value is outside the specified range)

After setting the Set point value(s) a Relay (none, 1, 2, 3, 4) can be configured for that Set Point. The Relay delay is set to 10 seconds and the Hysteresis is set to 5%. If a releay is configured as HOLD relay, it will not be selectable in this menu.



See "Save changes" dialog for options to the Save changes menu..

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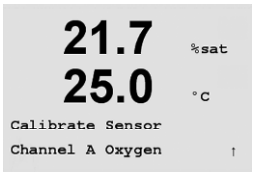
7 Calibration

(PATH: Cal)

7.1 Exit calibration mode

NOTE: to exit Calibration mode at any time press the ◀ and ▶ key simultaneously (escape). The transmitter returns to the Measurement mode and the old calibration values remain active.

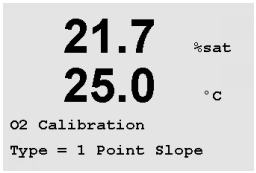
7.2 Enter calibration mode



While in Measurement mode press the ▶ key. The display prompts you to enter the calibration security code. Press the ▲ or ▼ key to set the calibration security code, then press the [ENTER] key to confirm the calibration security code.
Press the ▲ or ▼ key to select one of the following calibration sub functions: Oxygen, Temperature, Edit or Verify.
A flahing H in the top left hand corner shows the ongoing calibration process with a Hold condition active.

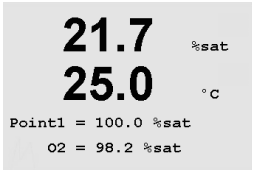
7.3 Oxygen calibration

7.3.1 1-point calibration

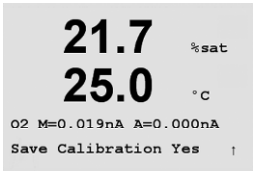


Enter Calibration mode as described in section 7.2.

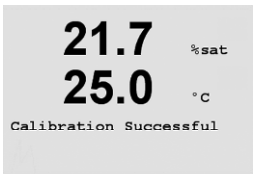
A O_2 sensor calibration is always a one point calibration either an Air (Slope) or a Zero (Offset) calibration.



A one point slope calibration is done in air and a one point offset calibration is done at 0 ppb O_2. Press the [ENTER] key after selecting Slope or Offset.



Enter the value for Point 1 including a decimal point. O_2 is the value being measured by the transmitter and sensor in the units set by the user. Press [ENTER] when this value is stable to perform the calibration.



After the calibration the slope calibration factor S and the offset calibration factor Z are displayed. Select „Yes" to save the calibration values and the successful Calibration is confirmed on the display.

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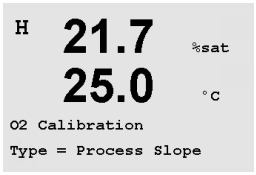
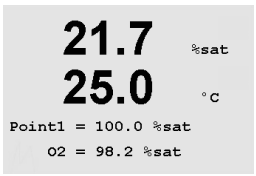
7.3.2 Process calibration

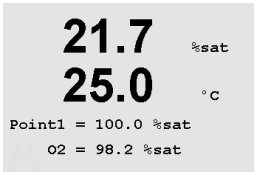


Enter Calibration mode as described in section 7.2.

Slope or Zeropt Process calibration can be selected. Choose a Slope Process calibration if you are working in the high measuring range (i.e. around 100%sat) and choose a Zero Process calibration if you are working in the low measuring range.

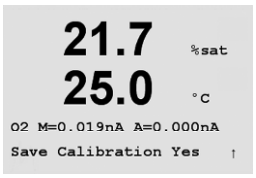


Take a snap shot of the measuring value by pressing the [ENTER] key. The M300 will return to the measuring mode and the Letter of the Channel that is being calibrated will flash (i.e. A). Take a sample and determine the O_2 value.



Pushing the [CAL] key will bring up the calibration screen again and the value of Point 1 can now be entered.

Pressing [ENTER] will display the slope calibration factor S and the offset calibration factor Z are displayed.



Select „Yes" to save the calibration values and the successful Calibration is confirmed on the display

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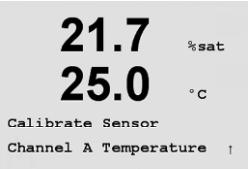
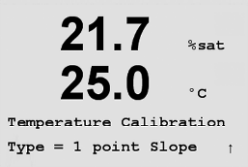
7.4 Temperature calibration

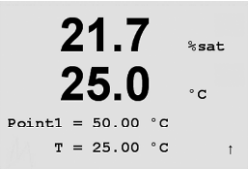


Enter Calibration mode as described in section 7.2 and select "Temperature Calibration".

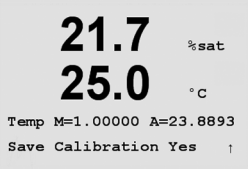
7.4.1 One – point temperature calibration



See 7.4 on how to enter the Temperature Calibration menu. Slope or Offset can be selected with the 1 point calibration. Select "Slope" to recalculate the Slope factor M and Offset to recalculate the offset calibration factor A.

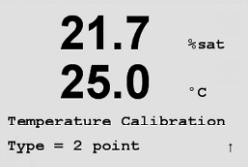


Enter Point 1

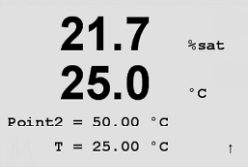


The newly calculated value – either M or A – is displayed. Select „Yes" to save the new calibration values and the successful Calibration is confirmed on the display.

7.4.2 Two – point temperature calibration



See 7.4 on how to enter the Temperature Calibration menu. Select 2 point as calibration Type.



Enter the value for Point 1 and press [ENTER].

Enter the value for Point 2 and press [ENTER].

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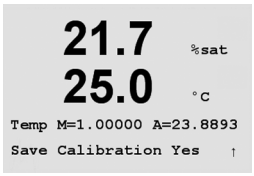
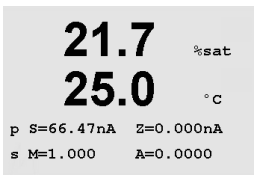


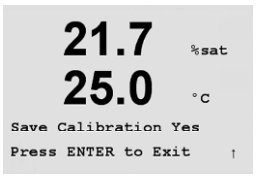
The newly calculated values M and A are displayed. Select „Yes" to save the new calibration values and the successful Calibration is confirmed on the display.

7.5 Edit

Enter Calibration mode as described in section 7.2 and select "Edit".

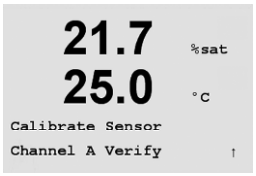


All calibration constants of the primary measurement (p) for the sensor are displayed on Line 3. All calibration constants of the secondary measurement (s) for the sensor are displayed on Line 4. The calibration constants can be changed in this menu.



Select „Yes" to save the new calibration values and the successful Calibration is confirmed on the display.

7.6 Verify



Enter Calibration mode as described in section 7.2 and select "Verify".

The value of the primary measurement (nA for a O_2 sensor) and the value of the secondary measurement (resistance of the temperature sensor for all sensors) are shown. The meter calibration factors are used when calculating these values.

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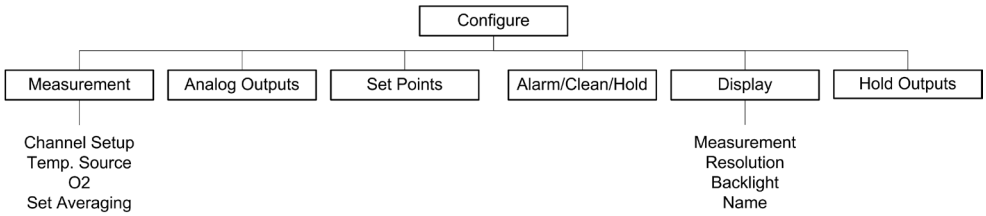
8 Configure

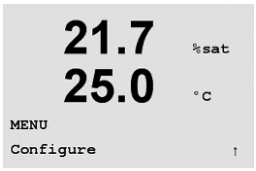
(PATH: Menu/Configure)



8.1 Exit configuration mode

NOTE: to exit Configuration mode at any time press the ◀ and ▶ key simultaneously (escape). The transmitter returns to the Measurement mode and the old settings remain active.

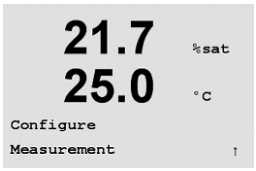
8.2 Enter configuration mode



While in Measurement mode press ◀ the key. Press the ▲ or ▼ key to navigate to the Configure – Menu. After selecting the Configure – Menu enter the configuration security code and then press the [ENTER] key to confirm the code.

8.3 Measurement

(Menu/Configure/Measurement)



Press the [ENTER] key to select this Menu. Following sub menus can now be selected: Channel Setup, Temperature Source, O_2 and Set Averaging

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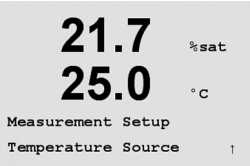
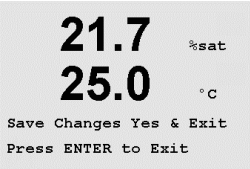
8.3.1 Channel setup



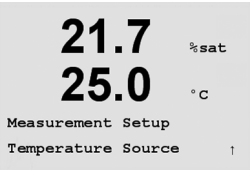
Press the [ENTER] key to select this Menu.

The 4 lines of the display can now be configured with a value. Pressing the [ENTER] key will display the selection for lines c and d.



Pressing the [ENTER] key again will bring up the Save Changes dialog.

8.3.2 Temperature source



Press the [ENTER] key to select this Menu. The following option can be chosen: Fixed or Use this channel
Fixed: allows a specific temperature value to be entered.
Use this channel: temperature input will be taken from the sensor attached.

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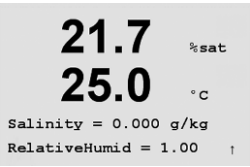
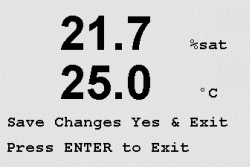
8.3.3 O_2

Press the [ENTER] key to select this Menu, which allows for the setting of additional measurement parameters for the O_2 measurement.

Atmospheric pressure and Process Pressure can be set. The default value for AtmPres is 760.0 and the default unit is mmHg. The units ProcPres and AtmPres do not have to be the same.

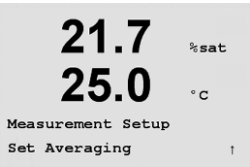


The salinity of the measured solution and the relative humidity of the calibration gas can also be entered. The allowed values for Relative Humidity are in the range 0.00 to 1.00. Pressing the [ENTER] key again will bring up the Save Changes dialog.

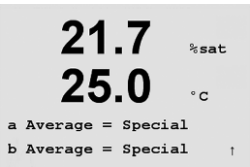


Selecting "No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

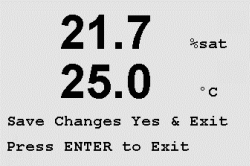
8.3.4 Set averaging



Press the [ENTER] key to select this Menu. The averaging method (noise filter) for each channel can now be selected. The options are Special (Default), None, Low, Medium and High:



None = no averaging or filtering
Low = equivalent to a 3 point moving average
Medium = equivalent to a 5 point moving average
High = equivalent to a 7 point moving average
Special = averaging depending on signal change (normally High averaging but Low averaging for large changes in input signal)



Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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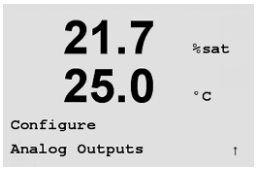
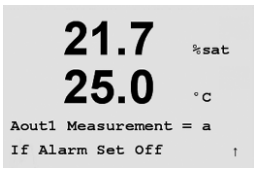
8.4 Analog outputs

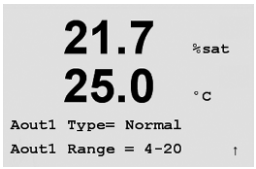
(PATH: Menu/Configure/Analog Outputs)



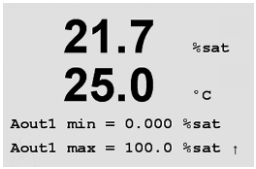
Press the [ENTER] key to select this Menu, which lets you configure the 2 Analog Outputs.



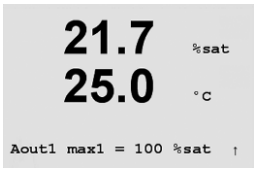
The analog output number (1 or 2, default is 1), the channel (a, b, c, d or blank (none)) and a value (off, 3.6 mA or 22.0 mA. default is off) is configured. If a mA value is set it is the value the analog output will go to if any of the alarm conditions occur



The Aout type can be Normal, Bi-Linear, Auto-Range or Logarithmic.
The range can be 4-20mA or 0-20mA. Normal provides linear scaling between the minimum and maximum scaling limits and is the default setting. Bi-Linear will also prompt for a scaling value for the mid-point of the signal and allows two different linear segments between the minimum and maximum scaling limits.

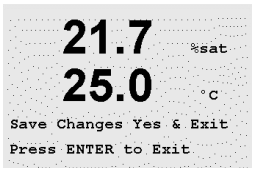


Enter the minimum and maximum Value of Aout.



If Auto-range was selected as Type then Aout max1 can be configured. Aout max1 is the maximum value for the first range on Auto-Range. The maximum value for the second range on Auto-Range was set in the previous menu. If Logarithmic Range was selected, it will also prompt for the number of decades as 'Aout1 # of Decades =2'.

The value for the Hold mode can be configured to hold the last value or can be set to a fixed value.



Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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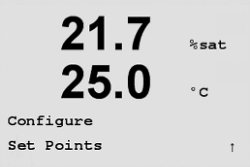
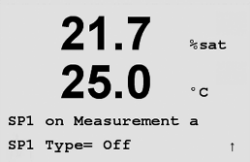
8.5 Set points

(PATH: Menu/Configure/Set Points)



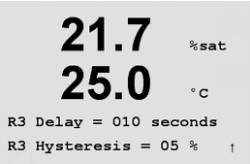
Press the [ENTER] key to select this Menu.



Up to 4 Set Points can be configured on one of the channels (a .. d). Possible types are Off, High, Low, Outside and Between.
An 'Outside' Setpoint will cause an alarm condition whenever the measurement goes above its high limit or below its low limit. A 'Between' Setpoint will cause an alarm condition to occur whenever the measurement is between its high and low limits

Enter the desired value(s) for the Set Point

This screen provides the option to configure a setpoint to be active on an over range condition. Select the setpoint (1 thru 4) and 'Yes' or 'No'. Select the desired relay that will activate when the setpoint alarm condition is reached.



Set the Relay delay and the Hysteresis of the configured Set Point.

Set the type of Relay contact, either normal or inverted.
Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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8.6 Alarm/Clean

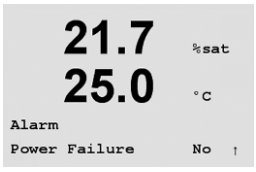
(PATH: Menu/Configure/Alarm/Clea)

This Menu allows the configuration of Alarm and Clean functionality.

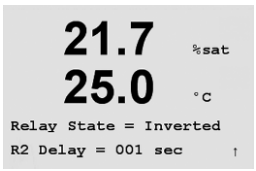
8.6.1 Alarm

Select the Relay to be used for the Alarm.

Select either the "Power failure" or "Software failure" event to be alarmed.
If either of these is set to yes then the alarm will come on and an alarm message will be recorded if:
1. there is a power failure or power cycling
2. the software watchdog performs a reset



The alarm indicator will be turned off when the alarm message is cleared. They will reappear if the power is constantly cycling or if the watchdog is repeatedly resetting the system.



Configure the chosen Alarm Relay. The state can be Normal or Inverted, also a Delay for the activation can be set.
Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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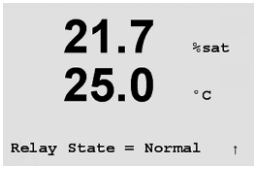
8.6.2 Clean

Configure the Relay to be used for the cleaning cycle.

The Cleaning Interval can be set from 0.000 to 999.9 hours. Setting it to 0 turns the clean cycle is off. The cleaning time can be 0 to 9999 seconds and must be smaller than the Cleaning Interval.

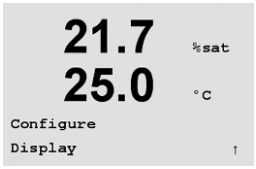
Select the desired Relay state: Normal or Inverted.



Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

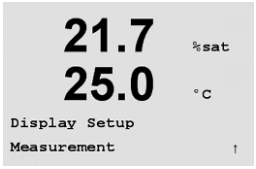
8.7 Display

(PATH: Menu/Configure/Display)

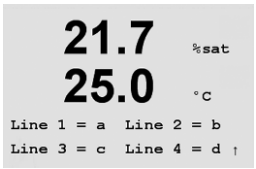


This Menu allows for the configuration of the values to be displayed and also the configuration of the Display itself.

8.7.1 Measurement



The Display has in 4 Lines. Line 1 on top and Line 4 on the bottom.



Select the values (channels) to be displayed on each line of the display.

If this is set to On then when an alarm occurs the message "Failure – Press [ENTER] will be on Line 4 in the normal measurement mode.

Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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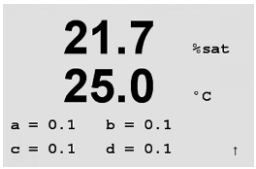
8.7.2 Resolution

This menu allows the setting of the resolution of each displayed value.



Possible settings are 1, 0.1, 0.01, 0.001 or Auto.

Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting No will discard the entered values, selecting „Yes" will make the entered values the current ones.

8.7.3 Backlight

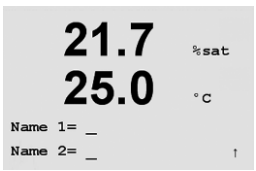
This Menu allows the setting of the back light options of the display.

Possible settings are On, On 50% or Auto Off 50%. If Auto Off 50% is selected then the backlight will go to 50% after 4 minutes with no keypad activity. The backlight will automatically come back on if a key is pressed.

Pressing the [ENTER] key again will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

8.7.4 Name

This menu allows for the configuration of a text which is displayed on Lines 3 and 4 of the Display.



The Name can be alphanumeric and is displayed in the last 11 characters of Line 3 and Line 4 during normal measurement mode. The default is nothing (blank).

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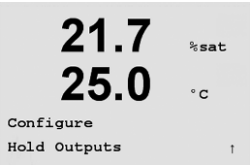
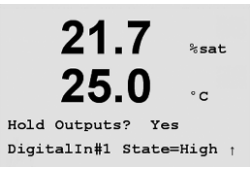
8.8 Hold outputs

(PATH: Menu/Configure/Hold Outputs)



This Menu allows for the configuration of the Hold status. The HOLD function is used if a Easy Clean system is controlled from the M300 or if a control of the HOLD functionality is required from an overlying system.
Initiating a hold condition will maintain the analog signal output and relay status at the value/ state at the time the Hold is initiated, for as long as the Hold state is maintained. In addition, the USB output will be held if the USB Hold option is set to "Last Values". The USB Hold feature is set to "Off" by default. Refer to section 9.2 for more information on the USB settings.



Analog outputs, Relays and USB will not be held if No is selected. If Yes is selected, Outputs will be held depending of the status of Digital Input # 1. The choices are 'high' or 'low'. All outputs will be held if the digital input is in the selected state. If 'Off' is selected as DI (Digital Input) status, the Digital Input is inactive and the Hold status will not be triggered through an external signal, although the outputs will be held during configuration or calibration procedures as long as the hold Outputs option is 'Yes.

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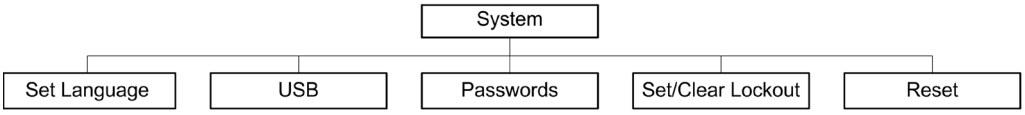
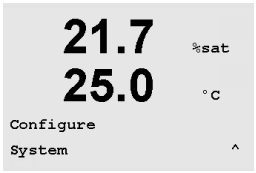
9 System

(PATH: Menu/System)



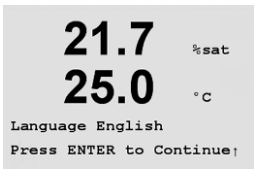


While in Measurement mode press ◀ the key. Press the ▼ or ▲ key to navigate to the System – Menu. After selecting the System – Menu enter the System security code and then press the [ENTER] key to confirm the code.

9.1 Set language

(PATH: Menu/System/Set Language)

This Menu allows the configuration of the Display language.



Following Selections are possible: English, French, German, Italian and Spanish.

Pressing the [ENTER] key will bring up the Save Changes dialog. Selecting „No" will discard the entered value, selecting „Yes" will make the entered value the current one.

9.2 USB

(PATH: Menu/System/USB)

This menu allows for the configuration ofg the USB port

USB Hold can be set to OFF or Last Values. This allows the user to select whether or not the USB output will hold the Last value, or continue to output the current value during a Hold Outputs condition.

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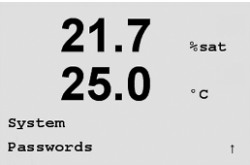
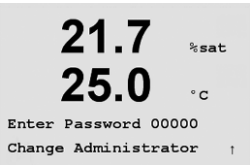
9.3 Passwords

(PATH: Menu/System/Passwords)

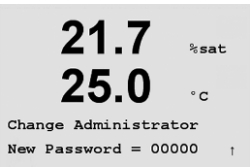


This Menu allows for the configuration of Operator and Administrator Passwords, as well as setting up a List of allowed Menus for the Operator. The Administrator has rights to access all Menus.



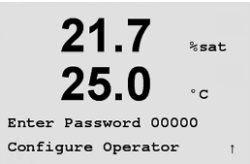
The Passwords Menu is protected: Enter the Administrator Password to enter the Menu.

9.3.1 Changing passwords



See 9.3 on how to enter the Passwords Menu. Then select "Change Administrator" or "Change Operator" to change the appropriate Password and set the new Password. Pressing the [ENTER] key will bring up the Save Changes dialog. Selecting „No" will discard the entered Password, selecting „Yes" will make the entered Password the current one.

9.3.2 Configuring menu access for operator



See 9.3 on how to enter the Passwords Menu. Then select "Configure Operator" to configure the Access list for the Operator. It is possible to assign/deny rights to the following Menus:

Cal Key, Configuration, System, PID Setup and Service. Choose either „Yes" or „No" to give/deny access to the above Menus Menus and press [ENTER] to advance to the next items. Pressing the [ENTER] key after configuring all menus will bring up the Save Changes dialog. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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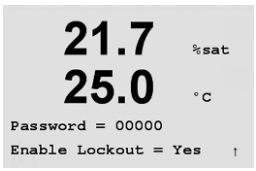
9.4 Set/clear lockout

(PATH: Menu/System/Set/Clear Lockout)

The user will be asked for a password before being allowed into any menus if the Lockout functionality is enabled.



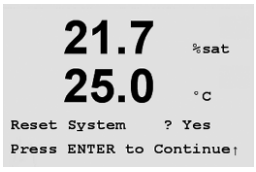
The Lockout – Menu is protected: Enter the Administrator Password and select „Yes" to enable or „No" to disable the Lockout functionality. Pressing the [ENTER] key after the selection will bring up the Save Changes dialog.

9.5 Reset

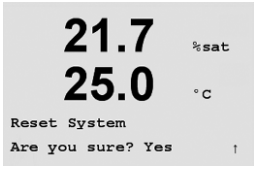
(PATH: Menu/System/Reset)

This Menu allows for following options:
Reset System, Reset Meter Cal, Reset Analog Cal.

9.5.1 Reset system



This Menu allows the reset of the meter to the factory default settings (see Default tables) The meter calibration and the analog output calibration are not affected.



Pressing the [ENTER] key after the selection will bring up a confirmation screen. Selecting „No" will discard the entered value, selecting „Yes" will make the entered value the current one.

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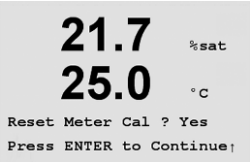
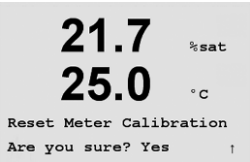
9.5.2 Reset meter calibration

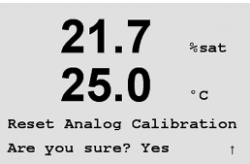


This Menu allows the reset of the meter's calibration factors to the last factory calibration values.

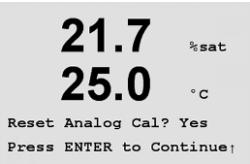


Pressing the [ENTER] key after the selection will bring up a confirmation screen. Selecting „No" will discard the entered value, selecting „Yes" will make the entered value the current one.

9.5.3 Reset analog calibration



This Menu allows the reset of the Analog Output calibration factors to the last factory calibration values.



Pressing the [ENTER] key after the selection will bring up a confirmation screen. Selecting „No" will discard the entered value, selecting „Yes" will make the entered value the current one.

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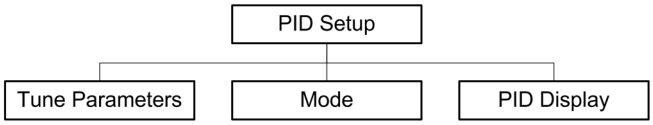
10 PID setup

(PATH: Menu/PID Setup)



PID control is proportional, integral and derivative control action that can provide smooth regulation of a process. Before configuring the transmitter, the following process characteristics must be identified.

Identify the **control direction** of the process:
Deaeration-direct acting where increasing measurement produces increasing control output such as controlling the feed of
a reducing agent to remove oxygen from boiler feedwater
Aeration-reverse acting where increasing measurement produces decreasing control output, such as controlling an aerator blower speed to maintain a desired O_2 concentration in fermentation or wastewater treatment

Identify the **control output** type based on the control device to be used:
Pulse Frequency-used with pulse input metering pump
Pulse Length-used with solenoid valve
Analog-used with current input device such as electric drive unit, analog input metering pump or current-to-pneumatic (I/P) converter for pneumatic control valve

Default control settings provide linear control which is appropriate for dissolved oxygen. The non-linear control settings are used in pH/ORP models of this transmitter. Therefore ignore settings of deadband and corner points in the Tuning Parameter section below.

To counteract this, the instrument allows for adjustable non-linear control with settings of a deadband around the setpoint, corner points further out and proportional limits at the ends of control as shown in the figure below. Determine the appropriate settings for each of these control parameters based on the shape of the process titration curve.

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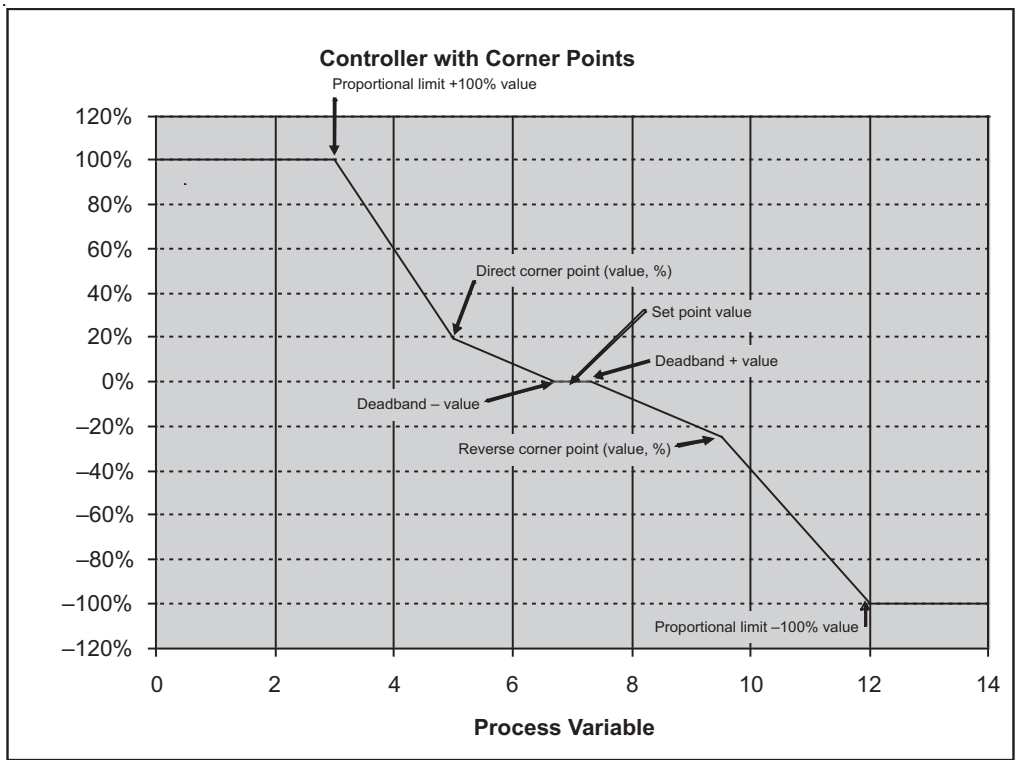

10.1 Enter PID Setup

While in Measurement mode press the ◀ key. Press the ▲ or ▼ key to navigate to the PID Setup – Menu. After selecting the PID Setup – Menu enter the System security code "xxxxx" and then press the [ENTER] key to confirm the code.

10.2 PID A/M

(PATH: MENU/PID Setup/PID A/M

Select Auto or Manual as an operation mode. Running the PID controller in Auto means the M300 does the controlling of the outputs. Running in Manual mode allows for manual control of the outputs.
In Manual, the control output may be adjusted with the up and down arrow keys. (The "Info" key function is not available in Manual.).

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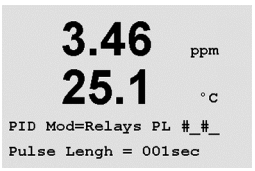
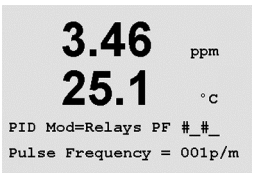
10.3 Mode

(PATH: MENU/PID Setup/Mode

This menu contains the selection of control modes using relays or analog outputs. Press [ENTER].
This menu assigns a relay or analog output for PID control action as well as details of their operation. Based on the control device being used, select one of the following three paragraphs for use with solenoid valve, pulse input metering pump or analog control.

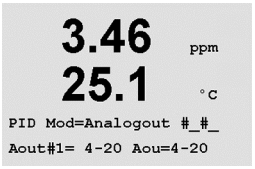


Pulse Length – If using a solenoid valve, select "Relays" and "PL", Pulse Length. Choose the first relay position as #1 if the Reverse control action is needed. Choose the second relay position as #2 for Direct acting control. Set the pulse length (feed cycle time) in seconds. A short pulse length will provide more uniform feed. A longer pulse length will reduce wear on the solenoid valve. A value of 30 seconds may be a good starting point. The % "on" time in the cycle is proportional to the control output.



Pulse Frequency – If using a pulse input metering pump, select "Relays" and "PF", Pulse Frequency. Choose the first relay position as #3 if Reverse control action is needed. Choose the second relay position as #4 for Direct acting control action. Set the pulse frequency to the maximum frequency allowed for the particular pump being used, typically 60 to100 pulses/ minute. Control action will produce this frequency at 100% output.

CAUTION: Setting the Pulse Frequency too high may cause the pump to overheat.



Analog – If using Analog control, change "Relays" to "Analogout" using up/down arrow keys. Choose the first Analogout position as #1 if Reverse control action is needed. Choose the second Analogout position as #2 for Direct control action. Select the analog output current range required by the control device, 4-20 or 0-20 mA. Press [ENTER].

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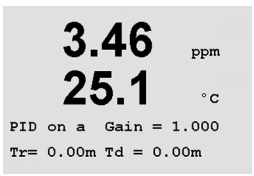
10.3.1 Tune Parameters

(PATH: MENU/PID Setup/Tune Parameters

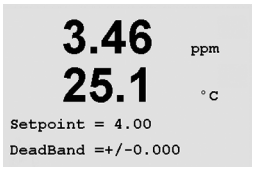
This menu assigns control to a measurement and sets the setpoint, tuning parameters and non-linear functions of the controller through a series of screens.

10.3.2 PID Assignment & Tuning



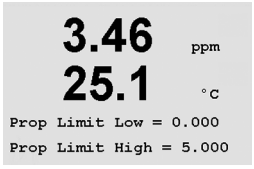
Assign the measurement, a, b, c, or d to be controlled after "PID on_". Set the Gain (unitless), Integral or Reset time Tr (minutes) and Rate or Derivative time Td (minutes) needed for control. Press [ENTER]. Gain, Reset and Rate are later adjusted by trial and error based on process response.

10.3.3 Setpoint & Deadband



Enter the desired setpoint value and the deadband around the setpoint, where no proportional control action will take place. Press [ENTER].

10.3.4 Proportional Limits



Enter the low and high proportional limits in dissolved oxygen units – the range over which control action is required. Press [ENTER].

10.3.5 Corner Points

Enter the low and high corner points in dissolved oxygen units and the respective output values from –1 to +1, shown in the figure as –100 to +100%. Press [ENTER].

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10.4 PID Display Setup

(PATH: MENU/PID Setup/PID Display Setup

This screen enables display of PID control status including % output and Auto/Manual in the normal measurement mode. (In addition, for the display to be enabled, a measurement must be assigned under Tune Parameters and a relay or analog output must be assigned under Mode.)

If „Yes" is selected the status (Man or Auto) and control output will be displayed on the bottom line.

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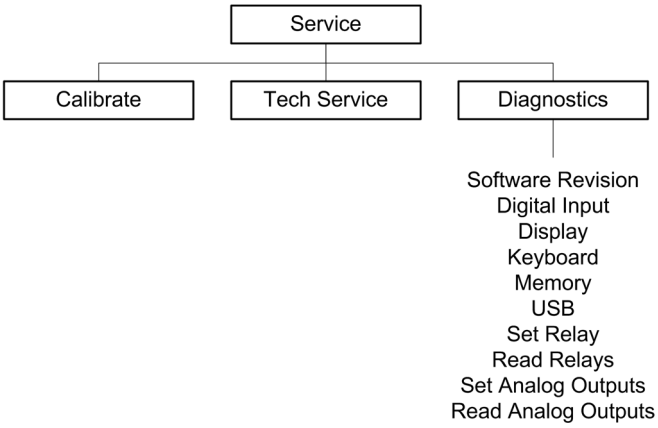
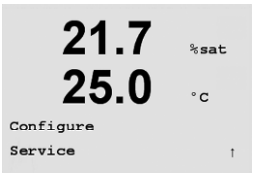
11 Service

(PATH: Menu/Service)





While in Measurement mode press the ◀ key. Press the ▲ or ▼ key to navigate to the Service – Menu. After selecting the Service – Menu enter the Service security code "xxxxx" and then press the [ENTER] key to confirm the code.

11.1 Diagnostics

(PATH: Menu/Service/Diagnostics)

This Menu is a valuable tool for troubleshooting and provides diagnostic functionality for following items: SW Revision, Digital Inputs, Display, Keypad, Memory, USB, Set Relay, Read Relays, Set Analog Outputs, Read Analog Outputs.

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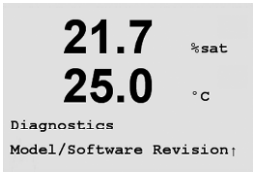
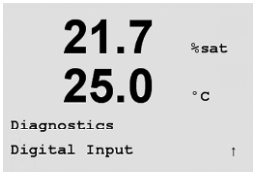
11.1.1 Model/Software Revision

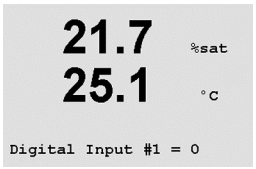


Essential information for every Service call is the model and software revision number. This Menu shows the transmitter part number, serial number and software version number. Press [ENTER] to exit from this display.

11.1.2 Digital Input



The digital Input menu shows the state of the digital input.

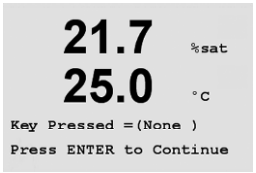


11.1.3 Display

All pixels of the display will be lit for 15 seconds to allow troubleshooting of the display. After15 seconds the transmitter will return to the normal measuring mode or press [ENTER] to return sooner.

11.1.4 Keypad

For the keypad diagnostics the display will indicate which key is pressed. Pressing Enter will return the transmitter to the normal measuring mode.



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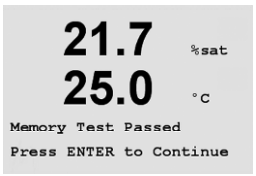
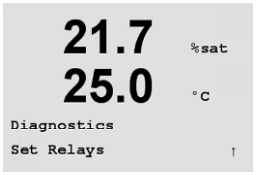
11.1.5 Memory

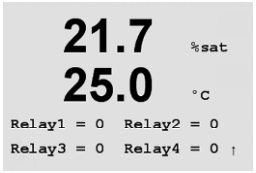
If Memory is selected then the transmitter will perform a RAM and ROM memory test. Test patterns will be written to and read from all RAM memory locations. The ROM checksum will be recalculated and compared to the value stored in the ROM.



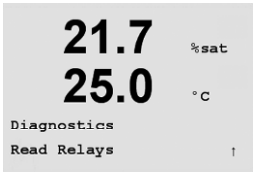
11.1.6 Set relay



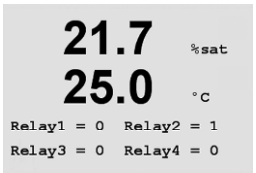
The Set Relays diagnostic menu allows for the manual activation/deactivation of each Relay.



11.1.7 Read relays



The Read Relays diagnostic menu shows the state of each Relay.



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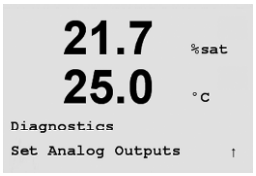
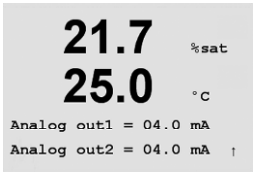
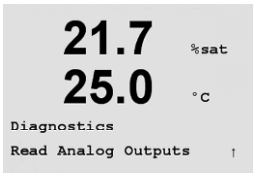
11.1.8 Set analog outputs



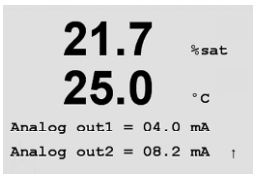
This menu enables the user to set all analog outputs to any mA value within the 0-22 mA range.



11.1.9 Read analog outputs



This menu shows the mA value of the analog Outputs.

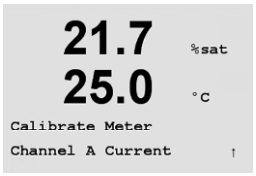


11.2 Calibrate

(PATH: Menu/Service/Calibrate)

This menu has the options to calibrate the transmitter and the analog outputs and also allows the unlocking of calibration functionality.

11.2.1 Calibrate meter



Channel A calibration can be selected as "Current" or "Temperature".

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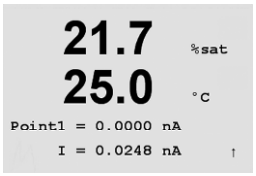
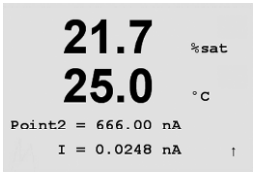
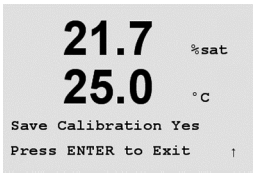
11.2.1.1 Current



Enter the value for Point 1 in milliamps of the current source connected to the input.

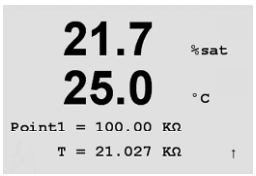


Enter the value for Point 2 in milliamps of the current source connected to the input.

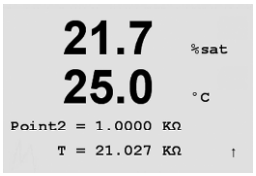


Pressing the [ENTER] key after entering Point 2 will bring up a confirmation screen. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

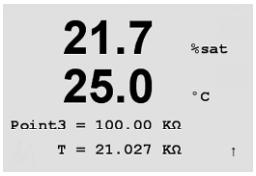
11.2.1.2 Temperature



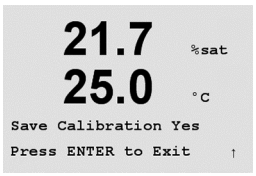
Enter the value for Point 1 of the calibration, according to the attached Resistor.



Enter the value for Point 2 of the calibration, according to the attached Resistor.



Enter the value for Point 3 of the calibration, according to the attached Resistor.



Pressing the [ENTER] key after entering Point 3 will bring up a confirmation screen. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

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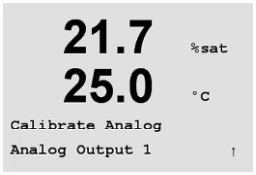
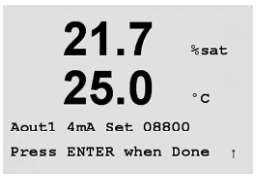
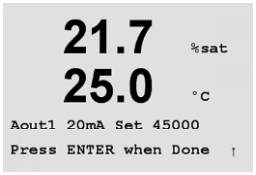
11.2.2 Calibrate analog



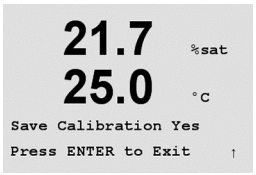
Select the Analog Output you wish to calibrate. Each Analog output can be calibrated at 4 and 20 mA.



Connect a Meter to the Analog output terminals and then adjust the five digit number in the display to set the output to 4mA and repeat for 20 mA.



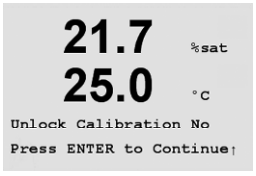
As the five digit number is increased the output current increases and as the number is decreased the output current decreases. Thus coarse changes in the output current can be made by changing the thousands or hundreds digits and fine changes can be made by changing the tens or ones digits.



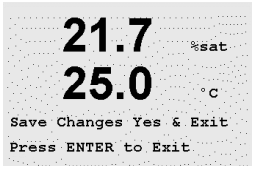
Pressing the [ENTER] key after entering both values will bring up a confirmation screen. Selecting „No" will discard the entered values, selecting „Yes" will make the entered values the current ones.

11.2.3 Calibrate unlock

Select this Menu to configure the CAL Menu, see chapter 7.



Selecting „Yes" means that Meter and Analog Output calibration Menus will be selectable under the CAL Menu. Selecting „No" means that only the Sensor calibration is available under the CAL Menu.



Pressing the [ENTER] key after the selection will bring up a confirmation screen.

11.3 Tech service

(PATH: Menu/Service/Tech Service)

NOTE: This Menu is for Mettler-Toledo Service personnel use only.

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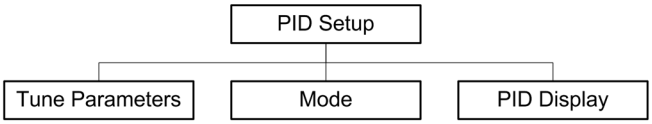
12 Info

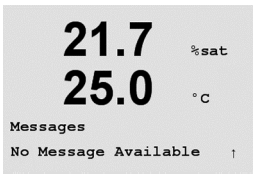
(PATH: Info)



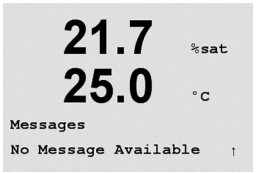
Pressing the key will display the Info Menu with the options Messages and Calibration Data

12.1 Messages

(PATH: Info/Messages)



The most recent message is displayed. The up and down arrow keys allow scrolling through the last four messages that have occurred.



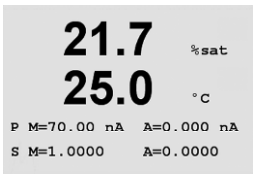
Clear Messages clears all the messages. Messages are added to the message list when the condition that generates the message first occurs. If all messages are cleared and a message condition still exists and started before the clear then it will not appear in the list. For this message to re-occur in the list the condition must go away and then reappear.

12.2 Calibration data

(PATH: Info/Calibration Data)

Selecting Calibration Data displays the slope (S) and offset calibration constants (Z).

P = calibration constants for the primary measurement
S = calibration constants for the primary measurement



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12.3 Model/software revision

Selecting Model/Software Revision will display the installed Firmware revision.

The displayed information is important for any Service call.

13 Maintenance

The device contains no user repairable components. To remove dust, dirt and spots, the external surfaces of the transmitter may be wiped with a damp, lint-free cloth.

13.1 For technical support

For technical support and product information contact your local METTLER TOLEDO Sales Office or representative

13.2 Front panel cleaning

Clean the front panel with a damp soft cloth (water only, no solvents). Gently wipe the surface and dry with a soft cloth.

14 Trouble shooting

If the equipment is used in a manner specified by these instructions, the protection provided by the equipment may be impaired.
Review the table below for possible causes of common problems:

Problem	Possible Cause
Display is blank.	– No power to M300. – Blown fuse. – LCD display contrast set incorrectly. – Hardware failure.
Incorrect measurement readings.	– Sensor improperly installed. – Incorrect units selected. – Temperature compensation incorrectly set or disabled. – Sensor or transmitter needs calibration. – Sensor or patch cord defective or exceeds recommended maximum length. – Hardware failure.
Measurement readings not stable.	– Sensors or cables installed too close to equipment that generates high level of electrical noise. – Recommended cable length exceeded. – Averaging set too low. – Sensor or patch cord defective.
Cannot change menu settings.	– User locked out for security reasons.

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14.1 Warning- and alarmlist

Warnings	Description
Warning O_2 Slope > 90nA	Slope too big
Warning O_2 Slope < 35nA	Slope too small
Warning O_2 ZeroPt > 0.3nA	Zero offset too big
Warning O_2 ZeroPt < –0.3nA	Zero offset too small

Alarms	Description
Watchdog time-out	SW/System fault
Error O_2 Slope > 110 nA	Slope too big
Error O_2 Slope < 30 nA	Slope too small
Error O_2 ZeroPt > 0.6 nA	Zero offset too big
Error O_2 ZeroPt < –0.6nA	Zero offset too small

14.2 Changing the fuse

Make sure that the mains cable is unplugged before changing the fuse. This operation should only be carried out by personnel familiar with the transmitter and who are qualified for such work.

If the power sonsumption of the M300 transmitter is too high or a manipulation leads to a short circuit the fuse will blow. In this case remove the fuse and replace it with one specified in Chapter 16.

15 Accessories and spare parts

Please contact your local METTLER TOLEDO Sales office or representative for details on available accessories and spare parts.

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16 Specifications

16.1 General specifications

Watchdog time-out	SW/System fault
Error O_2 Slope > 110 nA	Slope too big
Error O_2 Slope < 30 nA	Slope too small
Error O_2 ZeroPt > 0.6 nA	Zero offset too big
Error O_2 ZeroPt < –0.6nA	Zero offset too small

Sensor type	InPro 6800/6050
Measuring current	25 to 130 nA at 25 °C (77°F), 1 bar (14.5 psi)
Saturation range	0 to 500%
Concentration range	0.00 to 20.00 ppm (mg/l)
Measuring error	±0.5% of full scale reading
Measurement resolution	30pA
Temperature input	NTC 22 kΩ
Temperature compensation	Automatic
Temperature measuring range	–10 to 80 °C (14 to 176 °F)
Calibration	1-point (slope or offset calibration) Process calibration (slope or offset calibration)

16.2 Electrical specifications for 1/2DIN and 1/4DIN versions

Power requirements	100 to 240 V AC or 20 to 30 V DC
Frequency	50 to 60 Hz
Signal output	two 0/4 to 22 mA outputs for pH/mV and temperature, galvanically isolated
Measurement Error through analog outputs	< ±0.05 mA over 1 to 20 mA range, < ±0.10 mA over 0 to 1 mA range
Analog output configuration	Linear, Bi-Linear, Logarithmic, Autoranging
Load	Max. 500 Ω
Connection terminals	Detachable screw terminals
Digital communication	USB port, Type B connector
PID process controller	Pulse length, frequency or analog control
Connection terminals	Detachable screw terminals
Digital Input	1
Mains fuse	1.0A slow blow type FC
Relays	2-SPDT mechanical rated at 250VAC, 3Amps 2-Reed rated at 250VAC or DC, 0.5Amp switching
Alarm Relay delay	0–999 s
Keypad	5 tactile feedback keys
Display	four-line

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16.3 Mechanical specifications for 1/4DIN version

Dimensions (housing – H x W x D)*	96 x 96 x 140 mm (1/4DIN model)
Front bezel – (H x W)	102 x 102 mm
Max. depth	125 mm (excludes plug-in connectors)
Weight	0.6 kg (1.5 lb)
Material	ABS/polycarbonate
Ingress rating	IP 65 (front)/IP 20 (housing)

* H=Height, W=Width, D=Depth

16.4 Mechanical specifications for 1/2DIN version

Dimensions (housing – L x H x W)*	144 x 144 x 116 mm
Front bezel – H x W	150 x 150 mm
Max. D – panel mounted	87 mm (excludes plug-in connectors)
Weight	0.95 kg (2 lb)
Material	ABS/polycarbonate
Ingress rating	IP 65

* H=Height, W=Width, D=Depth

16.5 Environmental specifications for 1/2DIN and 1/4DIN versions

Storage temperature	–40 to 70 °C (–40 to 158 °F)
Ambient temperature operating range	–10 to 50 °C (14 to 122 °F)
Relative humidity	0 to 95% non-condensing
Emissions	According to EN55011 Class A
UL Electrical Environment	Installation (overvoltage) category II

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17 Default tables

Parameter	Sub parameter	Value	Unit
Alarm (except flow)	Relay	2	
	Diagnostics	Off	
	SW	Off	
	HW	Off	
	Delay	1	sec
	Hysteresis	0	
	State	inverted	
Clean	Relay	1	
	Interval	0	Hrs
	Clean time	0	Sec
	State	Normal	
	Delay	0	
	Hysteresis	0	
Language		English	
Passwords	Administrator	00000	
	Operator	00000	
All Relays (unless otherwise specified)	Delay	10	sec
	Hysteresis	5	%
	State	Normal	
	Hold mode	Last	
Lockout	(On/Off)	No = Off	
Channel A	Measurement a	DO high (6050)	% sat
	Measurement b	Temperature	°C
	Measurement c		
	Measurement d		
Ccal constants	O_2	M=1.0, A=0.0	
	Temperature	M=1.0, A=0.0	
Analog Out	1	Ch A–O_2	
	2	Ch A–temperature	
All analog out	Mode	4–20 mA	
	Type	Normal	
	Alarm	Off	
	Hold mode	Last	
O_2	Value 4 mA	0	% sat
	Value 20 mA	100	% sat
Temperature	Value 4 mA	0	°C
	Value 20 mA	100	°C
Set point 1	Signal	a	
	Type	Off	
	Value	50	% sat
Relay 3	Set point	1	
Set point 2	Signal	b	
Parameter	Sub parameter	Value	unit
	Type	Off	
	Value	50	°C
Relay 4	Set point	2	
V polarization		–675	mV
Resolution	Temperature	0.1	°C
	O_2	0.1	%

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18 Waranty

METTLER TOLEDO warrants this product to be free from significant deviations in material and workmanship for a period of one year from the date of purchase. If repair is necessary and not the result of abuse or misuse within the warranty period, please return by freight pre-paid and amendment will be made without any charge. METTLER TOLEDO's Customer Service Dept. will determine if the product problem is due to deviations or customer abuse. Out-of-warranty products will be repaired on an exchange basis at cost.

The above warranty is the only warranty made by METTLER TOLEDO and is lieu of all other warranties, expressed or implied, including, without limitation, implied warranties of merchantability and fitness for a particular purpose. METTLER TOLEDO shall not be liable for any loss, claim, expense or damage caused by, contributed to or arising out of the acts or omissions of the Buyer or Third Parties, whether negligent or otherwise. In no event shall METTLER TOLEDO's liability for any cause of action whatsoever exceed the cost of the item giving rise to the claim, whether based in contract, warranty, indemnity, or tort (including negligence).

19 UL Statement (Pending)

Mettler-Toledo Thornton, Inc., 36 Middlesex Turnpike, Bedford, MA 01730, USA has obtained Underwriters Laboratories' listing for 300 Model Transmitters. They bear the cULus Listed mark, signifying that the products have been evaluated to the applicable ANSI/UL and CSA Standards for use in the U.S. and Canada.

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